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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BISSETT, MELANIE D

ART UNIT

PAPER NUMBER

1711

DATE MAILED: 03/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/029,860

Applicant(s)

DAVIS ET AL.

Examiner

Melanie D. Bissett

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-62 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) 1-14, 16-25, 27-39 and 42-62 is/are rejected.
- 7) ☐ Claim(s) 15, 26, 40 and 41 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 19 October 2001 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 51-56 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the reaction product of an isocyanate quasi-prepolymer and a blend of active amine and phenolic resin compounds, does not reasonably provide enablement for the reaction product of a blend of isocyanate *and additional* isocyanate quasi-prepolymer reacted with blend (b). The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. Does the applicant intend to claim "wherein said first component comprises an isocyanate quasi-prepolymer", or is the claim truly intended to limit (a) to an isocyanate blend?

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 30-31, 45-47, 49, 53-54, 58-59, and 61-62 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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5. Claim 30 recites the limitation "said amine-terminated chain extenders" in line 1.

There is insufficient antecedent basis for this limitation in the claim.

6. Claim 40 recites the limitation "said amine terminated chain extenders" in line 1.

There is insufficient antecedent basis for this limitation in the claim.

7. Claims 58-59 recite the limitation "said amine-terminated *polyether resins*" in line

1. There is insufficient antecedent basis for this limitation in these claims.

8. Claim 61 recites the limitation "said elastomeric coating" in line 1. There is insufficient antecedent basis for this limitation in the claim.

9. Claim 62 recites the limitation "said elastomeric coating" in line 2. There is insufficient antecedent basis for this limitation in the claim.

10. Claim 53 recites a Markush group including "polyether polyols, polyester polyols, amine-terminated polyethers, and polyesters of hydroxyl-terminated rubbers, having an equivalent weight of at least about 500, phenolic resins, and blends thereof." Because of the placement of the equivalent weight limitation, it is unclear whether the applicant intends to limit the equivalent weight of all of the components preceding the limitation, the single component immediately preceding the limitation, or the entire Markush group.

11. Claims 30 and 45 recite improper Markush language "selected from the group consisting *essentially* of". Proper Markush groups use closed language such as "selected from the group consisting of" to convey that the claim is limited to one of the components of the Markush group. See MPEP 2173.05 (h). In this case, it is unclear whether the applicant intends to limit the claims to the cited components or whether the applicant intends to leave the group open to other possible components.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 1-6, 9-12, 14, 16-22, 24-25, 27-29, 32-34, 36-37, 39, 42-46, 48-53, 55-58, and 60-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bock et al.

14. Bock discloses curable polyurethane coating compositions comprising a polyisocyanate and a mixture of isocyanate-reactive compounds including a polyether polyamine and a polyether polyol (abstract). Examples show an isocyanate prepolymer mixed with a polyether polyol, a polyester polyol, Jeffamine T-5000 (a polyoxypropylene ether triamine having a molecular weight of 5000 and an equivalent weight of 1667), fillers, and pigments at an isocyanate index of 1.25:1. The resulting composition is applied to a sheet metal substrate. The isocyanate prepolymer is a reaction product of 2,4-tolylene diisocyanate (an aromatic diisocyanate) and a polyoxypropylene ether diol having a molecular weight of 2000. Bock notes the use of chain extenders, preferring the use of diamine compounds such as 3,5-diethyl-2,4- and/or -2,6-diaminotoluene (col. 7 lines 7-51). These compounds are equivalent to the applicant's claimed 1-methyl-3,5-diethyl-2,4- or -2,6-diaminobenzene. The reference does not specify a preference for the addition of a phenolic resin. However, Bock does note that phenol formaldehyde resins are suitable for use as component B2ii), a polyether polyol having 2-8 hydroxyl

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groups (col. 6 lines 18-54). The coatings of Bock's invention are shown to have improved low viscosity, long-term flexibility, overbaking resistance, adhesion to electrocoated sheet metal, and shelf life (col. 1 lines 7-15). Because Bock notes the use of phenol formaldehyde resins in the present invention, it is the examiner's position that it would have been prima facie obvious to use phenol formaldehyde in the exemplified coating compositions as the polyether component in the expectancy of a coating having equally improved low viscosity, long-term flexibility, overbaking resistance, adhesion to electrocoated sheet metal, and shelf life.

15. Regarding claims 4, 18-20, 43, and 56 limiting isocyanates used in the prepolymer, Bock teaches the use of diphenylmethane diisocyanates and aliphatic diisocyanates (col. 2 line 45-col. 3 line 40), where the isocyanates are stabilized with active hydrogen-containing materials before reaction with component B) (col. 3 line 41-col. 5 line 20), thus reacting and forming quasi-prepolymers.

16. Regarding claim 32 limiting a method to one reacting an isocyanate with a blend of active amine hydrogen-containing material, phenolic resin, and a hydroxyl-terminated polyether chain extender, it is noted that Bock teaches the use of hydroxyl-terminated polyether chain extenders such as triethylene glycol, tetraethylene glycol, etc. Thus, the hydroxyl-terminated polyether chain extender limitation is anticipated.

17. Regarding claim 33 limiting the reaction to take place in the absence of catalyst, it is noted that the reference exemplifies the use of catalysts but lists catalysts as common additives that may optionally be employed (col. 7 lines 65-67). Therefore, the reference encompasses the reaction of the materials in absence of catalyst.

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18. Claim 61 is a product-by-process claim drawn to a coated substrate, where the process of applying the coating includes using high temperature, high pressure, plural component spray equipment to impingement mix the first and second components and spraying the mixture onto a substrate. The reference teaches a coating having a viscosity low enough to allow brushing and spraying onto a substrate (col. 1 lines 7-14). The components are mixed before application (examples). It is the examiner's position that the coated substrates from either method would be indistinguishable, since both methods result in a substrate coated with a low-viscosity composition having identical mixed and curable components.

19. Claims 7 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bock et al. in view of Rice et al.

20. Bock applies as above, noting the use of aromatic diamine chain extenders but failing to mention the use of chain extender blends with aliphatic or cycloaliphatic diamine compounds. Rice teaches materials made by reacting a primary or secondary amine terminated polyether, an aromatic polyisocyanate, and a chain extender blend of aromatic and aliphatic diamines (abstract). Preferred aromatic diamine chain extenders include 1-methyl-3,5-diethyl-2,6-diaminobenzene (DETDA) or a mixture with 1-methyl-3,5-diethyl-2,6-diaminobenzene (col. 3 lines 17-27), and preferred aliphatic chain extenders include amine-terminated alkylenes (col. 3 lines 28-44). DETDA, used in both Bock and Rice, reacts very rapidly but produces premature gelling (Rice, col. 3 lines 56-62). Rice suggests that a blend of aromatic and aliphatic diamine chain

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extenders optimizes speed of reaction with improved processing characteristics (col. 3 line 63-col. 4 line 8). Because Bock employs similar materials and has shown to desire to improve processing (brushing and spraying viscosity), it is the examiner's position that it would have been prima facie obvious to add an aliphatic diamine chain extender to the aromatic chain extender in Bock's invention to improve the viscosity and processing of the material.

21. Claims 13, 30-31, 38, and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bock et al. in view of Primeaux, II. Primeaux, II (US 5,480,955 A) can be found on the applicant's Form PTO-1449.

22. Bock applies as above, noting the use of amine-terminated chain extenders having functionalities of 2-6 and molecular weights of 62-399 but failing to mention the use of polyether chain extenders. Primeaux, II teaches polyurea elastomer coatings made by reacting an isocyanate quasi-prepolymer with an amine-terminated polyether polyol and a chain extender, where amine-terminated polyether chain extenders are preferred to yield coatings having good cure and spray processing characteristics as well as improved flexibility and ultraviolet stability (col. 4 lines 16-56). The chain extenders have molecular weights of less than about 400 and functionalities of 2-6. It is the examiner's position that it would have been prima facie obvious to include amine-terminated polyether chain extenders in Bock's invention to improve cure, spray processing, flexibility, and UV stability.

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23. Also, Bock applies as above, noting the use of long-chain polyether polyol-modified isocyanate prepolymers, encompassing trifunctional polyols (col. 3 lines 29-40; examples) but failing to exemplify a prepolymer resulting from a trihydric initiator. Primeaux serves to show the conventionality of employing a polyether polyol based on trihydric initiators and having a molecular weight above about 4000 in isocyanate-terminated prepolymer production (col. 3 lines 8-20). Since Bock's invention generally encompasses trifunctional polyether polyols, it is the examiner's position that it would have been prima facie obvious to choose trifunctional polyether polyols having high molecular weights in the expectancy of forming a coating having equally improved low viscosity, long-term flexibility, overbaking resistance, adhesion to electrocoated sheet metal, and shelf life.

24. Claims 8, 23, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bock et al. in view of Finelli.

25. Bock applies as above, failing to mention the addition of epoxy resins to the coating compositions. Finelli discloses compositions made by preparing an isocyanate-terminated prepolymer by reacting an isocyanate with a hydrogen-containing polymeric material and curing a mixture containing the prepolymer and an epoxy resin (col. 1 line 65-col. 2 line 3). Suitable curing agents include glycol or diamine chain extenders (col. 4 lines 1-30). The resulting compositions have improved water resistance due to the addition of the epoxy resin (col. 1 lines 25-54; col. 2 lines 4-7). Therefore, it is the examiner's position that it would have been prima facie obvious to include an epoxy

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resin with the prepolymer component of Bock's invention to improve the water resistance of the resulting coating.

Allowable Subject Matter

26. Claims 15, 26, and 40-41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

27. Claims 47 and 59 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

28. The following is a statement of reasons for the indication of allowable subject matter:

29. The closest prior art, Bock et al., discloses curable polyurethane coating compositions comprising a polyisocyanate and a mixture of isocyanate-reactive compounds including a polyether polyamine and a polyether polyol. The use of diamine chain extending agents and phenol formaldehyde resins are both suggested. However, the reference requires the presence of polyols to react with the isocyanate and does not teach the inclusion of at least 70% amine groups based on the number of active hydrogen groups. Also, the reference does not teach the specific blending of primary and secondary amine-terminated polyols for reaction with the isocyanate. It is the examiner's position that the applicant's claimed amine group amount and amine-

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terminated polyol blend in the claimed methods and compositions would provide novel and unobvious steps over the prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie D. Bissett whose telephone number is (703) 308-6539. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (703) 308-2462. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

mdb
March 24, 2003


James Seidleck
Supervisory Patent Examiner
Technology Center 1700